According to *Science* the entomological collection of the late Henry Edwards has gone into the possession of the American Museum of Natural History, New York City. Friends in theatrical circles subscribed $10,000 and the Museum $5,000 for its purchase. The collection includes more than 350,000 specimens.

From *Psyche* we learn that a study of California butterflies, and especially their comparison with those of Eastern America and Europe, leads S. H. Scudder, in the *Overland Monthly* for April to claim that the highest type of human civilization is to arise on the Pacific coast.

Prof. C. H. T. Townsend of the New Mexico Agricultural College is vigorously prosecuting his studies of American Tachinidæ, as is shown by numerous recent papers in entomological periodicals.

Prof. J. B. Smith has recently published as Bulletin No. 851 of the U. S. National Museum a Revision of the Species of Mamestra.

In an admirably illustrated paper Dr. C. V. Riley gives, in recent *Insect Life* (v. IV, Nos. 7 and 8) an interesting account of the larger digger wasp (*Sphecius speciosus*), concluding with this suggestive paragraph: "If man could do what these wasps have done from time immemorial, viz., preserve for an indefinite period the animals he feeds on by the simple insertion of some toxic fluid in the tissues, he would be able to revolutionize the present methods of shipping cattle and sheep, and to obviate much of the cruelty which now attends the transportation of live stock and much of the expense involved in cold storage."

MICROSCOPY.[1]

Notes on Bone Technique.—In preparing bone for sectioning it is well to have fresh material taken from a young individual. After the soft parts are removed the bone is cut into short pieces and then macerated in water until the medulla is easily washed out; they are then ready to section.

Preparations nearly as good as those obtained by maceration may be made from fresh tissue. Thin sections are cut from the desired region with a fine saw; from these the medulla should be carefully washed out under a jet of water; they are then ground until the desired thinness is reached, again washed, dried and mounted. The grinding may be done with a file or on a revolving grindstone or with emery on a dentist's lathe[2], or between pieces of compact pumice stone, followed

[1]Edited by C. O. Whitman, Clark University, Worcester, Mass.

[2]Nealey, Am. Mon. Micro. Jour., 1884.

by hones of finer grain, and finally polished on a piece of smooth leather or buckskin covered with powdered chalk.

Another method is to grind the bone on a glass plate with emery of different degrees of fineness. This may be accomplished by pressing the section down with the fingers, or it may be fastened to a cork by means of sealing-wax or thick balsam. It is then polished on one side until smooth; then the wax or balsam is melted, the section turned and polished on the other side until the required thinness is reached. Only compact tissue can be prepared by this method. The spongy tissue, being very delicate, must be imbedded before sectioning. This may be done according to the method given by Wiel,[1] Koch's copal method[2] or a mixture of ten parts resin and one of ordinary wax may be used.[3] The objects should be placed in a very fluid, but not too hot, solution of the above, and after a short time lifted out with forceps, leaving as much of the mixture as possible adhering to the object. When cool the mass may be cut into thin sections and ground in the ordinary way, washed and cleared in turpentine and mounted in balsam. If an opaque preparation be desired the imbedding mass is removed by washing in chloroform and the section dried between sheets of filter paper and mounted.

A very convenient method is given by Ranvier.[4] The fragment of bone is placed in a syrupy solution of gum arabic, and when saturated it is exposed to the air until the gum thickens; it is then hardened in alcohol. From this mass sections are made and ground in the usual way, except alcohol is used to wet the hone instead of water. When ground sufficiently thin the gum is dissolved in water and the section is ready to mount. According to the method of mounting either opaque or transparent preparations are made. For the study of Haversian canals, lacunæ and canaliculi the former is better. To obtain an opaque preparation a drop of balsam is placed on the slide and heated over a spirit lamp to evaporate the oil; it is then cooled and tested by a needle. If hard the balsam is again softened and the dry section placed in it; at the same time a drop of balsam is placed on the cover glass which is applied, and the whole transferred to a cold surface; this should be done as quickly as possible in order that the balsam may solidify before penetrating the cavities. If, on

[1]Zeit. f. wiss. Mikros., Bd. iv, p. 200, 1888. Abstract AM. NAT., xxiii, p. 520, 1889.

[2]Whitman's Embryological Methods, p. 233.

[3]Ehrenbaum, Zeit. f. wiss. Mikros., Bd. i, p. 14, 1884.

[4]Traite, p. 249.

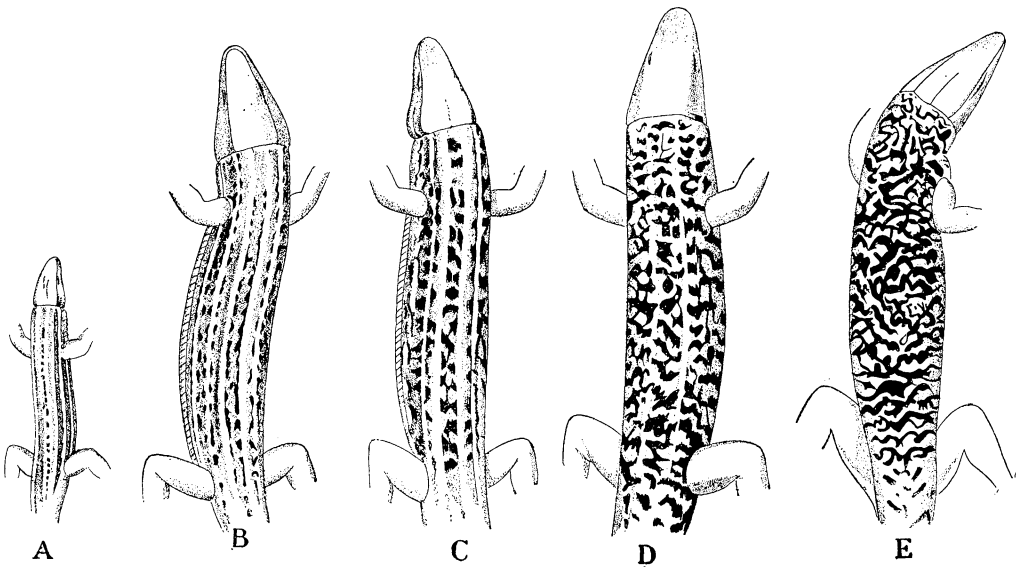
the other hand, we wish to study osseous lamellæ or stained preparations, the section is first placed in a solvent of balsam, then transferred to a warm solution of balsam until the entire canalicular system is filled, when it is mounted.

Methods of Decalcification.—*Thomas' Nitric Acid Method.*[1] —Pieces of fresh or hardened calcified tissue, bone, tooth, etc., are placed in 95% alcohol until completely saturated, then transferred to a solution consisting of five parts 95% alcohol and one part c.p. nitric acid, in which they are left for several days. The liquid should be occasionally shaken and renewed until the tissue is completely decalcified. The process is very rapid, owing to the solubility of the potassic nitrate in weak alcohol. Very large pieces may be decalcified in from two to three weeks. The object is then placed in a vessel of 95% alcohol, to which calcium carbonate is added until there is a residue of the precipitate. This mixture should also be occasionally shaken and renewed. After several days litmus paper no longer shows an acid reaction; the object is left in the fluid a day or two longer, then washed with a spray of alcohol, which removes the most of the calcium carbonate deposited on the surface. The extremely fine particles remaining do not in any way interfere with the cutting. If one wishes to avoid this deposition the object may be wrapped in filter paper. This, however, requires a longer time for the removal of the acid. By this method large pieces of very dense tissue are very rapidly decalcified and then completely freed from the acid; the soft parts undergo but little swelling, while the tissue stains as readily as before decalcification.

Haug's Phloroglucine Method.[2]—This is one of the most rapid decalcifying agents; the structures are perfectly preserved with the exception of blood, which is considerably changed. The introduction of the method is due to Andeer,[2] who used the phloroglucine in combination with hydrochloric acid, but with variable results. By substituting nitric acid perfectly uniform results are obtained. The solution is prepared by warming 1 g. phloroglucine in 10 c.c. of c.p. nitric acid. This must be done slowly and carefully; soon a dark ruby solution is obtained; to this is added 50 c.c. distilled water. If a larger quantity of the fluid is desired 10 c.c. acid are added to every 50 c.c. of water until the volume has reached 300 c.c., which is the limit of the protective

[1]Zeit. f. wiss. Mikros., Bd. viii, p. 191, 1891.
[2]Zeit. f. wiss. Mikros., Bd. viii, p. 8, 1891.
[3]Centrabl. f. d. med. Wiss., 1884, pp. 193–597.

PLATE XIX.



Lacerta muralis.

influence of the phloroglucine. In this solution the pieces of well fixed and washed material are placed. The decalcification is very rapid. Fœtal or young bones as well as those of the lower vertebrates are decalcified in half an hour. Older and harder bones require only a few hours. A 35% solution may be used for teeth, yet it is rarely found necessary to use stronger than 20%. If less rapid decalcification be desired the following formula may be used:

Phloroglucine	1 part.
Nitric acid	5 parts.
Alcohol, 95%	70 parts.
Distilled water	30 parts.

When decalcified the bones are washed in running water for about two days. The sections stain well and do not fade.

SCIENTIFIC NEWS.

A Grand Honorary Prize placed at the disposal of the Boston Society of Natural History by the late Dr. William J. Walker "for such investigation or discovery as may seem to deserve it, provided such investigation or discovery shall have been made known or published in the United States at least one year previous to the time of award," has been unanimously awarded to Prof. James D. Dana.

In recognition of the value of the scientific work of Prof. Dana and in testimony of the Society's high appreciation of his services to science the maximum sum of one thousand dollars has been awarded.

For the annual Walker Prizes a first prize of one hundred dollars has been awarded to Baron Gerard de Geer, of Stockholm, for an essay entitled "On Pleistocene Changes of Level in Eastern North America," and a second prize of fifty dollars to Prof. William M. Davis, of Cambridge, for an essay on "The Subglacial Origin of Certain Eskers."

The newly organized Chicago University has called bodily the whole Biological Department of Clarke University. The following persons from Clark have already accepted positions as professors, assistants, fellows, etc., at Chicago: C. O. Whitman, H. H. Donaldson, F. Mall, F. Boas, G. Baur, S. Watase, W. M. Wheeler, E. O. Jordan, C. L. Bristol, H. P. Johnson, F. R. Lillie, A. D. Mead.

The results of the great Japanese earthquake in Gifu-ken, where the damage was greatest, are thus summarized: 4889 deaths, 12,311